

Does infertility trigger fibromyalgia in women?

Infertility and fibromyalgia

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Abstract

Aim: Fibromyalgia syndrome (FS) is a syndrome identified by dispersed body pain, with a prevalence of 0.5% in men and 3.4% in women. This study aims to assess the association between infertility in women and fibromyalgia.

Material and Methods: To participate in this study, 476 patients referred to our hospital were selected. The study group consisted of 230 infertile participants, and the control group consisted of 246 fertile participants. The participants were examined and 43 of them were diagnosed with FS according to the 2010 ACR criteria. General information about the participants was received, and their BMI was measured. Participants responded to the Common pain scale (YGAS), Symptom Severity Scale (SSS), and Fibromyalgia Impact Questionnaire (FIQ).

Results: The age of the participants ranged from 20 to 45, with a mean of 29.5 (± 5.05) years. The participant's BMI range was 20 to 29.8, with a mean of 24.7 (± 2.4). The common pain scale in the study and control groups was 4.24 (± 2.3) and 3.3 (± 1.7), respectively. The difference in this variable between the two groups was significant (P -value= 0.000). The symptom severity scale in the study and control groups was 2.4 (± 1.3) and 1.6 (± 1.06), respectively. The difference in this variable between the two groups was significant (P -value= 0.000). The Fibromyalgia Impact Questionnaire score for fertile participants ranged from 30 to 70, with an average of 53 (± 14.8). There was no significant difference between the groups.

Discussion: Our results showed that infertile women have more fibromyalgia symptoms than fertile women. This result may indicate an association between fibromyalgia and infertility.

Keywords

Infertility; Fibromyalgia; In vitro fertilisation

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Introduction

Fibromyalgia syndrome (FS) is a syndrome identified by dispersed body pain, with a prevalence of 0.5% in men and 3.4% in women [1]. Like most chronic diseases, the etiology of this condition is unclear, but recent studies on the existence of disorders of the central nervous system confirm the existence of this disorder as a specific and chronic disease [2]. Usually, the first and most common symptom of this condition is body pain, and fatigue, sleep, and cognitive disorders are other symptoms of this condition [3]. Fibromyalgia is a complex and multifaceted disease with an unpredictable course [3]. Since the response to treatment and tolerance varies from patient to patient, treatment is a clinical problem for physicians and patients [1,2].

In 1990, the American College of Rheumatology (ACR) defined fibromyalgia syndrome based on an analysis of approximately 300 variables, such as physical signs and examinations and radiographic and laboratory findings, and proposed diagnostic criteria [4]. Fibromyalgia is essentially based on chronic pain that cannot be explained by an inflammatory or degenerative musculoskeletal disorder [5]. The ACR also found that many disorders are associated with fibromyalgia, including sleep disorders, fatigue, paresthesia, anxiety, headaches, and defecation [4].

Pregnancy is associated with weight gain and increased hormonal fluctuations, which puts pressure on various body systems and worsens fibromyalgia [6]. Many women often experience pain and discomfort, memory problems, and other signs and symptoms during this period that are very similar to fibromyalgia during pregnancy [6]. A pregnant woman with fibromyalgia may find that physical and emotional stress can worsen the signs and symptoms of the disorder [7]. Pregnant women with fibromyalgia experience pain, fatigue, and stress, which are common during the first and third trimesters [8]. Despite all these complications, the number of pregnant women with fibromyalgia who give birth to healthy babies is considerable [9], and the risk of infertility is a debatable issue in women with fibromyalgia.

However, studies, which shown a link between fibromyalgia and infertility are limited, and most studies in this area have focused on the relationship between fibromyalgia and female sexual function. This study aims to assess the association between infertility in women and fibromyalgia.

Material and Methods

From January 2020 to December 2020, 476 patients referred to our hospital were selected to participate in the study. The exclusion criteria were patient reluctance to participate in the study, systemic diseases, severe infections, and comorbidities associated with pregnancy. The participants were examined, and 43 were diagnosed with FS according to the 2010 ACR criteria. General information about participants was received, and their BMI was measured. Participants responded to the Common pain scale (YGAS) and Symptom Severity Scale (SSS) questionnaires. The SSS evaluates the symptoms by severity, frequency, time, and type, consisting of 11 questions with multiple-choice responses, scored from 1 point (mildest) to 5 points (most severe). We also considered a Total variable, which

was the sum of two questionnaires, YGAS and SSS. Participants diagnosed with FS also answered the Fibromyalgia Impact Questionnaire (FIQ). FIQ was introduced by Burckhardt et al. in 1991 to assess the effect of the disease on patients' pain, quality of life, fatigue, and well-being [10].

The study group consisted of 230 infertile participants, and the control group consisted of 246 fertile participants. The information of infertility duration, infertility cause, and ovarian reserve of infertile participants was obtained. Ethics approval was obtained from the institutional review board (approval number: 4, date: 16/01/2021). The entire study procedure was conducted in accordance with the Helsinki Declaration, and the necessary approvals were obtained from the Ethics Committee. The Kolmogorov test was used to show that quantitative variables were normally distributed. The Mann-Whitney test was used to examine the differences between the fertile and infertile groups. An independent samples t-test was used to compare Fibromyalgia Impact Questionnaire scores for fertile and infertile groups. For all tests, a significance level of 0.05 was considered. Data were analyzed using SPSS for Windows, Version 23.0 (Armonk, NY: IBM Corp).

Results

Out of 476 participants in this study, 230 were included in the study group (infertile), and 246 were included in the control group (fertile). The age of the participants ranged from 20 to 45, with a mean of 29.5 (± 5.05) years. The participant's BMI range was 20 to 29.8, with a mean of 24.7 (± 2.4). The common pain scale range was 2 to 13, with a mean of 3.7 (± 2.09). The symptom severity scale range was 1 to 7, with a mean of 2.02 to 1.2. Among the participants, 43 were diagnosed with FS for these participants, the Fibromyalgia Impact Questionnaire scores ranged from 30 to 75, with a mean of 53.6 (± 12.05). In the study group, infertility time was assessed based on the number of infertility years, ranging from 1 to 13, with a mean of 4.1 (± 2). Also, for the infertile group, the cause of infertility frequency for endometriosis, inexplicable, male factor, ovulatory dysfunction, and tubal was 23 (± 4.8), 51 (± 10.7), 78 (± 16.4), 42 (± 8.8), and 36 (± 7.60), respectively. Descriptive Statistics of the patients are given in Table 1.

The results of the Kolmogorov test show that not all quantitative variables were normally distributed. The Mann-Whitney test was used to examine the differences between the Fertile and Infertile groups. The comparison of the study and control groups according to fibromyalgia status is given in Table 2.

As shown in Table 2, the mean age for the study group was 29.5 (± 5.5) and 29.6 (± 4.5) for the control group. The measured BMI for the study and control groups was 24.6 (± 2.4) and 24.8 (± 2.4), respectively. There was no significant difference between the age and BMI of fertile and infertile groups (P -values = 0.2 and 0.5, respectively). The common pain scale in the study and control groups was 4.24 (± 2.3) and 3.3 (± 1.7), respectively. The difference in this variable between the two groups was significant (P -value= 0.000). Also, the Symptom severity scale in the study and control groups was 2.4 (± 1.3) and 1.6 (± 1.06), respectively. The difference in this variable between the two groups was significant (P -value= 0.000). The total variable, which was the sum of two YGAS and SSS variables, was also

significantly different in the two groups (P-value= 0.000). Three variables associated with fibromyalgia had higher values in the infertile group. This result shows that the infertile group had more symptoms of fibromyalgia than the fertile group.

As shown in Table 3, the infertile participants' scores on the Fibromyalgia Impact Questionnaire ranged from 30 to 68, with a mean of 52.4 (±10). The score for fertile participants ranged from 30 to 70, with an average of 53 (±14.8). There was no significant difference between the fertile and infertile groups in the effect of FS on the quality of life of the participants (P-value = 0.893).

Table 1. Descriptive Statistics of variables

Variable	N	Minimum	Maximum	Mean	Sd
Age	476	20	45	29.5	5.05
BMI	476	20	29.8	24.7	2.4
Common Pain Scale	476	2	13	3.7	2.09
Symptom Severity Scale	476	1	7	2.02	1.2
Fibromyalgia Impact questionnaire	47	30	75	53.6	12.05
Infertility time	230	1	13	4.1	2
		Frequency	Percent		
Fibromyalgia					
Do not have		433		91	
Have		43		9	
Fertility status					
Infertile		230		48.3	
Fertile		246		51.7	
Cause of Infertility					
Endometriosis		23		4.8	
Inexplicable		51		10.7	
Male factor		78		16.4	
Ovulatory dysfunction		42		8.8	
Tubal		36		7.6	

Table 2. Comparison of the study and control groups according to fibromyalgia status

Variable	Infertile		Fertile		Sig.
	infertile + fibromyalgia Mean(±SD)	infertile - fibromyalgia Mean(±SD)	fertile + fibromyalgia Mean(±SD)	fertile - fibromyalgia Mean(±SD)	
Age	28.5(±2.4)	29.6(±5.5)	37.9(±3.8)	29.1(±4.1)	0.2
		29.5(±5.5)		29.6(±4.5)	
BMI	24.8(±2.4)	24.6(±2.5)	26.5(±2.5)	24.7(±2.4)	0.5
		24.6(±2.4)		24.8(±2.4)	
Common Pain Scale	3.3(±0.4)	4.3(±2.4)	9.5(±2.02)	2.9(±0.6)	0.000
		4.2(±2.3)		3.3(±1.7)	
Symptom Severity Scale	1.9(±0.87)	2.4(±1.3)	5.1(±0.9)	1.4(±0.5)	0.000
		2.4(±1.3)		1.6(±1.06)	
Total	5.2(±1.2)	6.8(±3.6)	14.6(±1.5)	4.3(±0.97)	0.000
		6.6(±3.5)		4.9(±2.6)	

Table 3. Fibromyalgia Impact Questionnaire scores for fertile and infertile groups

Fibromyalgia Impact Questionnaire	Infertile + FS		Fertile +FS		P-value
	Min-Max	Mean (SD)	Min-Max	Mean (SD)	
	30-68	52.4(±10)	30-70	53(±14.8)	0.893

Discussion

FS is a chronic disease in which the patient experiences somatic symptoms and diffuse sensitivities. Following the introduction of the disease by the ACR in 1990 and the introduction of new criteria in 2010, researchers became interested in the disorder. In this study, the 2010 ACR criteria were used to diagnose FS. FS is more common in females in general, especially during childbearing years, and can have a negative impact on patients' quality of life [11]. Studies in this area have focused on the effects of FS on pregnant women, but in this study, we examined the relationship between FS and infertility. Our results show that infertile women have significantly higher FS-related scores, which means that people with FS are more likely to be infertile. The findings of our study were consistent with the findings of Schochat and Beckmann [12]. In this study, the authors found a correlation between FS, reduced fertility, and late menarche.

In a similar study, Shakir, Badr [13] examined FS in infertile Iraqi women. The study included 202 infertile Iraqi women, and the results showed that the prevalence of FS was significantly higher in infertile Iraqi women than in the general population. These results are consistent with the results obtained in our study. Our results showed that FS symptoms are more common in infertile women compared to the fertile populations.

Another study found that women who reported FS had higher infertility rates [14]. This study concludes that the presence of FS may be an influential factor in female infertility. Our results also showed that FS symptoms are more common in infertile women, and this result can be interpreted as a correlation between FS and infertility.

Since FS is not directly related to the reproductive system, and infertility is a complex issue and is influenced by various factors, many factors affect this relationship. For example, many studies have examined the relationship between FS and endometriosis [15-17]. Endometriosis is a condition in which cells similar to the uterus' lining cells grow outside the uterus [16]. This condition can cause infertility [17]. Studies have shown that women with endometriosis are significantly more exposed to FS [15-17].

Studies have shown that psychological factors such as stress and anxiety can also play a role in infertility [18,19]. Since research has shown that fibromyalgia increases stress levels in patients [18-20], FS can also indirectly affect infertility. Environmental stress in women is one of the important factors in reducing ovulation and infertility [20]. It is important to consider that the mother's body must be emotionally, mentally, and physically ready to accept the child's stress and responsibilities. The mother should try to reduce her stress during and after pregnancy to reduce the severity of signs and symptoms of depression [19].

Studies have shown that there is a possible link between fibromyalgia and the following disorders: 1) intrauterine growth restriction (IUGR), in which fetal growth is restricted in the mother's uterus and causes the fetus to be small; 2) Recurrent miscarriage 3) Polyhydramnios where the level of amniotic fluid is very high. FS is also associated with preterm birth, congenital disabilities, fetal overgrowth, and stillbirth [6,7].

Hormonal disorders can also have a great impact on infertility

in women. Female hormones play a very important role in the menstrual cycle [5]. Deficiency in the production of these hormones, production rate, the balance between hormones, and defects in the organs producing these hormones can cause infertility in women. In patients with fibromyalgia, several disorders regulating the hormones such as the hypothalamus, pituitary, and adrenal glands have been observed [21–24]. These factors can also cause indirect effects of FS on infertility. Many other factors can also affect this relationship. Unfortunately, the research done to identify the relationship between fibromyalgia and infertility is very limited. To investigate this relationship, more studies should be needed taking into account psychological factors, hormonal levels, and various reproductive disorders. The results of this study indicate the association between fibromyalgia and infertility, which can be used as a basis for future studies in this field.

Conclusion

In this study, the association between fibromyalgia and infertility was investigated. Our results showed that infertile women have more fibromyalgia symptoms than fertile women. This result may indicate an association between fibromyalgia and infertility. Further studies are needed to evaluate the influencing factors and how they affect this relationship.

Scientific Responsibility Statement

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

Animal and human rights statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.

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Conflict of interest

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